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ABSTRACT

In recent years, there has been a dramatic increase in the volume of empirical research directed toward the issue of sex-roles, including the development of evaluative instruments such as the Attitudes Toward Women Scale (AWS) and the Personal Attributes Questionnaire (PAQ). The United States Military Academy's Project Athena, designed to examine the impact of admitting women to the military academy on both the institution and individual cadets, has repeatedly tested the cadet population with several psychological measures using a longitudinal design procedure. Cadets completed the AWS and PAQ before and after cadet basic training. The PAQ was also administered five times throughout a two-year period. Results indicated that the AWS and PAQ tests were reliable and that the PAQ scores were quite stable over time. The internal consistency coefficients were very high for both measures. The test-retest reliability coefficients suggest that both these scales measure relatively stable characteristics of the respondents. (Author/HLM)

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(1) Reliability of the Attitudes toward Women Scale (AWS) and the Personal Attributes Questionnaire (PAQ)

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(4) Male and female cadets at the U.S. Military Academy were given a battery of psychological tests over a two and one-half month period. The stability and internal consistency of Spence and Helmreich's Attitudes toward Women Scale and Personal Attributes Questionnaire were comparable to other frequently used psychological tests.

(5) Topical session preference:

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Reliability of the Attitudes Toward Women Scale (AWS) and the Personal Attributes Questionnaire (PAQ)

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Social Psychology/Personality

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In recent years, we have seen a dramatic increase in the volume of empirical research directed toward the issue of sex-roles. One important reflection of and catalyst to this high level of activity has been the development of research instruments specifically designed to measure concepts important to understanding sex-role phenomena. Two of the most extensively used instruments of this type are the Attitudes toward Women Scale (AWS) and the Personal Attributes Questionnaire (PAQ) (Spence & Helmreich, 1978).

The AWS measures attitudes concerning the rights, roles, obligations, and privileges that women should have in modern society. It provides scores along a continuum ranging from endorsement of traditional sex-roles to an egalitarian view of the roles of women and men.

The PAQ is a self-concept scale. Items in this scale can be classified into three general categories: (a) characteristics that are generally regarded as being highly masculine and that are desired by both men and women (PAQ M), (b) qualities that are more stereotypically ascribed as feminine and that are positively valued by both women and men (PAQ F), and (c) personality attributes that are desirable for one gender and undesirable for the other (PAQ M-F). The M-F score is like a traditional, unidimensional masculinity-femininity scale with high scores indicating masculinity and low scores reflecting femininity. The subscales were designed, and shown to be, independent. Spence and Helmreich (1978) use the combination of each respondent's M and F scores to classify that

person as androgynous, masculine, feminine, or undifferentiated in his or her self concept.

In their several publications describing these two instruments, Spence and Helmreich have presented surprisingly limited reliability information (Spence & Helmreich, 1972, 1978; Spence, Helmreich & Stapp, 1973, 1974). For both the AWS and the PAQ, they reported only one estimate of internal consistency. No test-retest reliability information has been provided for either the AWS or the PAQ. The objective of the present article is to further examine the reliability of these two measures.

The United States Military Academy's Project Athena (Vitters, Note 1) provided an especially good opportunity to examine the reliability of these measures. The purpose of Project Athena is to examine the impact of admitting women to the military academy on both the institution and individual cadets. Part of this research project has involved repeated testing of the cadet population with a number of standard psychological measures, including the two Spence and Helmreich sex-role instruments. This longitudinal design provided the data necessary to assess the test-retest reliability of these measures as well as their internal consistency at different points in time.

The inclusion of several other well-known psychological measures in the Project Athena design provided an important comparative basis for evaluating the reliability of the two sex-role measures. This variable set included both attitudinal and personality scales. The personality measures were the Rotter Locus of Control (Rotter, 1966), the Tennessee Self-Concept Scale (Fitts, 1965), and Sarason's (1962) Test Anxiety Scale. There was also an attitudinal measure of organizational commitment (Porter, Steers, Mowday, & Bovlian, 1974).

Method

Materials

As several different versions of the Spence and Helmreich measures are now available, it is important to identify precisely the scales employed. The 25-item AWS, identified by Spence and Helmreich (1972) as the short version of the scale, was used throughout this study. High scores indicate an egalitarian view, while low scores represent traditional attitudes concerning the role of women.

The PAQ used in this study was the 24-item scale described by Spence and Helmreich (1978). On the basis of individuals' M and F scores, they were classified as androgynous (high M, high F), masculine (high M, low F), feminine (low M, high F), or undifferentiated (low M, low F). The norms established by Spence and Helmreich (1978) using college students were used to define high and low M and F scores (medians were 21 and 23, respectively).

Subjects and Procedure

The basic design of Project Athena called for administration of the tests in early July, and again in mid-September, of 1976 to 1,007 male and 78 female freshman cadets. Cadet Basic Training, a stressful introduction to military life, intervened between these administrations. These numbers reflect some attrition (initially, there were 1,221 men and 119 women). In addition, the PAQ was administered to this entire class of cadets at five different times throughout a two-year period.

Results

The AWS and PAQ tests are reliable, as shown by the two and one-half month test-retest reliabilities and coefficient alpha measures of internal consistency listed in Table 1. A comparison of these reliability coefficients with those of the other personality and attitudinal tests administered at the same times indicates that the sex-role measures are as reliable as these other generally used psychological tests.

The test-retest reliability coefficients for the repeated PAQ testings, given in Table 2, provide even stronger evidence of the stability of scores on these scales. Over a period of two years, these scores were quite stable.

As mentioned earlier, PAQ scores have been used to categorize individuals as androgynous, masculine, feminine, or undifferentiated. Cadets were classified into one of these four categories, first using their PAQ scores at time 1 and again at time 2. Table 3 shows the consistency of these classifications for male and female respondents. The principal diagonal shows the percentage of individuals placed in each category at time 1 who remained in that category after a second testing over two months later. For example, 70% of those men classified as androgynous at time 1 were classified similarly at time 2. The percentages are similar for men and women. Overall, 57% of all the men and 54% of all the women remained in the same sex-role category across testings. The rows of the table show shifts in categorization. Both women and men tended to shift to the androgynous and masculine categories after basic training. Such a shift is not surprising given the high physical performance demands of basic training.

Implications and Conclusions

The decision to use any psychological measure requires adequate information about both its reliability and validity. The reliability assessment reported in the present article suggests that the reliability of both the AWS and PAQ is good. For both measures, the internal consistency coefficients were very high. Furthermore, the test-retest reliability coefficients suggest that both these scales measure relatively stable characteristics of the respondents, especially when one considers the quite dramatic nature of the experience during the test-retest interval. These reliability data, in conjunction with the construct validity data reported by Spence and Helmreich (1978), should encourage researchers to include these scales in future research requiring either a measure of attitudes toward women's role in society (the AWS) or self-perceptions of masculinity and femininity (the PAQ).

Reference Notes

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Table 1

The Reliability of the Personality and Attitude Measures

Measure: Subjects	Test-Retest Reliability	Coefficient Alpha	
		Time 1	Time 2
AWS			
Total	.828	.853	.865
Males	.743	.831	.851
Females	.797	.810	.817
PAQ M			
Total	.745	.771	.765
Males	.584	.773	.765
Females	.623	.756	.738
PAQ F			
Total	.724	.701	.706
Males	.536	.697	.717
Females	.668	.744	.651
TSCS--total positive			
Total	.693	a	a
Males	.693	a	a
Females	.713	a	a
ROTTER I-E			
Total	.711	.704	.697
Males	.690	.707	.698
Females	.734	.678	.675
TAS			
Total	.552	.726	.756
Males	.514	.714	.750
Females	.706	.757	.811
P			
Total	.634	.696	.702
Males	.430	.696	.715
Females	.347	.701	.683

[a]Since the authors did not have access to the items of the TSCS, no coefficient alphas could be calculated. However, Fitts (1965) reports high internal consistency with other samples.

Note.--There is a two and one-half month span between times 1 and 2. The measures are: AWS--Attitudes toward Women Scale, PAQ--Personal Attributes Questionnaire with its subscales, masculinity (M), femininity (F), TSCS--Tennessee Self-Concept Scale (total positive score), ROTTER--Rotter I-E Locus of Control Scale (29 items), TAS--Test Anxiety Scale (16 items), and P--Porter's measure of organizational commitment (15 item). High scores represent high levels of the characteristic measured by the scale, externality for the Rotter, and egalitarian attitudes for the AWS

Table 2

Test-Retest Reliabilities of PAQM and PAQF

PAQM

	Time 1	Time 2	Time 3	Time 4	Time 5
Time 1	1.00	.62	.45	.62	.67
Time 2	.58	1.00	.52	.70	.70
Time 3	.49	.48	1.00	.63	.62
Time 4	.55	.55	.64	1.00	.68
Time 5	.41	.46	.58	.61	1.00

PAQF

	Time 1	Time 2	Time 3	Time 4	Time 5
Time 1	1.00	.67	.48	.57	.44
Time 2	.54	1.00	.47	.63	.62
Time 3	.46	.51	1.00	.65	.41
Time 4	.46	.46	.56	1.00	.41
Time 5	.43	.45	.51	.53	1.00

Note.—The correlations for female cadets are listed above the diagonal and for males, below it. Time 1 = June 1976 (pre-CBT), Time 2 = August 1976 (post-CBT), Time 3 = April 1977, Time 4 = August 1977, Time 5 = August 1978.

Table 3

Percentages of Cadets Classified by Sex Type Before and After Cadet Basic Training

Sex Type Time 1	MALES Sex Type Time 2				FEMALES Sex Type Time 2			
	Androgynous	Masculine	Feminine	Undifferentiated	Androgynous	Masculine	Feminine	Undifferentiated
Androgynous	70	20	4	6	65	13	19	3
	(214)	(60)	(14)	(18)	(20)	(4)	(6)	(1)
Masculine	31	56	2	11	18	59	18	5
	(146)	(266)	(12)	(51)	(4)	(13)	(4)	(1)
Feminine	37	5	32	26	30	0	30	40
	(23)	(3)	(20)	(16)	(3)	(0)	(3)	(4)
Undifferentiated	21	28	7	44	13	40	7	40
	(35)	(45)	(12)	(72)	(2)	(6)	(1)	(6)

Note.--Reading rows, the per cent of respondents in each category at time 1 is listed according to how they are classified at time 2. The sum of the percentages across rows equals 100%. The numbers in parentheses are the number of respondents in each cell.